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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			ROTH, LAURA K	
			ART UNIT	PAPER NUMBER
			2852	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/072,998	NISHIKINO ET AL. <i>AN</i>
	Examiner	Art Unit
	Laura K. Roth	2852

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on ____.
 2a) This action is FINAL. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-83 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
 5) Claim(s) ____ is/are allowed.
 6) Claim(s) 1-83 is/are rejected.
 7) Claim(s) ____ is/are objected to.
 8) Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 12 February 2002 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. ____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. ____ .
3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>8/28/02-2/20/03</u>	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
	6) <input type="checkbox"/> Other: ____ .

Information Disclosure Statement

The information disclosure statements filed between 28 August 2002 and 20 February 2003 fails to comply with 37 CFR 1.98(a)(1), which requires the following: (1) a list of all patents, publications, applications, or other information submitted for consideration by the Office; (2) U.S. patents and U.S. patent application publications listed in a section separately from citations of other documents; (3) the application number of the application in which the information disclosure statement is being submitted on each page of the list; (4) a column that provides a blank space next to each document to be considered, for the examiner's initials; and (5) a heading that clearly indicates that the list is an information disclosure statement. The information disclosure statement has been placed in the application file, but the information referred to therein has not been considered.

The IDS Search (see Search History Printout) document submitted on 28 August 2002 that is in the proper PTO-1449 form has been considered.

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character “A” has been used to designate both Carriage A (fig.1) and Arrow A (fig.8). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “drawn shape” of the “engaging part” must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet,

and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The disclosure is objected to because of the following informalities: the reference numbers "105a" and "105b" should be rewritten as - -115a- - and - -115b- -, respectively (p.30, ln.18-19; p.31, ln.1).

Appropriate correction is required.

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 6, 9, 11, 14-17, 19, 22, 24, 45-47, 50, 53, 55, 58-60, 68-70, 73, 76, 78, and 81-83 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsutsui et al. (US 4,728,988) in view of Watanabe et al. (US 5,441,456).

Regarding claim 1, Tsutsui et al. (US 4,728,988) teach a drive unit comprising: a drive shaft (fig.4, #29); a drive pulley attached to said drive shaft (fig.4, #25, #26); and a drive wire driven by said drive pulley (fig.4, #13, #14) so as to move a movable body (fig.4, #3, #4).

Regarding claim 2, Tsutsui et al. (US 4,728,988) teach a drive unit wherein said drive pulley comprises a hole through which said drive wire is passed (fig.1, #30).

Regarding claim 3, Tsutsui et al. (US 4,728,988) teach a drive unit wherein said drive pulley comprises an engaging part that engages and holds said drive wire (fig.1, #27, #31; fig.3).

Regarding claim 6, Tsutsui et al. (US 4,728,988) teach a drive unit wherein said drive pulley comprises engaging means for engaging and holding said drive wire (fig.1, #27, #31; fig.3).

Regarding claim 9, Tsutsui et al. (US 4,728,988) teach a drive unit wherein said drive pulley appears to be formed so as to be press-fitted to said drive shaft (fig.2, shaft #29 protrudes from left hand side of pulley #25).

Regarding claim 11, Tsutsui et al. (US 4,728,988) teach a drive unit wherein said drive pulley comprises at least one flange (fig.2, #25, though denoting the pulley, points one of two flanges).

Regarding claim 14, Tsutsui et al. (US 4,728,988) teach a drive unit wherein said drive pulley comprises: a wire winding part around which said drive wire is wound (fig.2, #32); and a groove provided to said wire winding part so as to hold said drive wire (fig.2, #30).

Regarding claim 17, Tsutsui et al. (US 4,728,988) teach a drive unit comprising: a drive shaft (fig.4, #29); a drive pulley attached to said drive shaft (fig.4, #25, #26); and a drive wire driven by said drive pulley (fig.4, #13, #14) so as to move a movable body (fig.4, #3, #4).

Regarding claim 19, Tsutsui et al. (US 4,728,988) teach a drive unit comprising: a drive shaft (fig.4, #29); a plurality of drive pulleys attached to said drive shaft (fig.4, #25, #26); and a plurality of drive wires driven by said drive pulleys (fig.4, #13, #14) so as to move a movable body (fig.4, #3, #4).

Regarding claim 22, Tsutsui et al. (US 4,728,988) teach a drive unit comprising: a drive shaft (fig.4, #29); a drive pulley attached to said drive shaft (fig.4, #25, #26); and a drive wire driven by said drive pulley (fig.4, #13, #14) so as to move a movable body

(fig.4, #3, #4), wherein said drive pulley comprises at least one flange (fig.2, #25, though denoting the pulley, points one of two flanges).

Regarding claim 24, Tsutsui et al. (US 4,728,988) teach a drive unit wherein said drive pulley comprises: a wire winding part around which said drive wire is wound (fig.2, #32); and a groove provided to said wire winding part so as to hold said drive wire (fig.2, #30).

Regarding claim 25, Tsutsui et al. (US 4,728,988) teach a method of producing a drive unit moving a movable body by a drive wire driven by a drive pulley attached to a drive shaft (fig.4, a drive unit #1 moving #3/#4 by a drive wire #13/#14 by a drive pulley #25/#26 attached to a drive shaft #29 is produced by some means).

Regarding claim 45, Tsutsui et al. (US 4,728,988) teach an image reading apparatus comprising: an optical system for scanning and reading an image (fig.4, #17, #19); a running body including said optical system (fig.4, #3, #4); and a drive unit (fig.4, #1), the drive unit comprising: a drive shaft (fig.4, #29); a drive pulley attached to said drive shaft (fig.4, #25, #26); and a drive wire driven by said drive pulley (fig.4, #13, #14) so as to move the running body (fig.4, #3, #4).

Regarding claim 46, Tsutsui et al. (US 4,728,988) teach an image reading apparatus wherein said drive pulley comprises a hole through which said drive wire is passed (fig.1, #30).

Regarding claim 47, Tsutsui et al. (US 4,728,988) teach an image reading apparatus wherein said drive pulley comprises an engaging part that engages and holds said drive wire (fig.1, #27, #31; fig.3).

Regarding claim 50, Tsutsui et al. (US 4,728,988) teach an image reading apparatus wherein said drive pulley comprises engaging means for engaging and holding said drive wire (fig.1, #27, #31; fig.3).

Regarding claim 53, Tsutsui et al. (US 4,728,988) teach an image reading apparatus wherein said drive pulley appears to be formed so as to be press-fitted to said drive shaft (fig.2, shaft #29 protrudes from left hand side of pulley #25).

Regarding claim 55, Tsutsui et al. (US 4,728,988) teach an image reading apparatus wherein said drive pulley comprises at least one flange (fig.2, #25, though denoting the pulley, points one of two flanges).

Regarding claim 58, Tsutsui et al. (US 4,728,988) teach an image reading apparatus wherein said drive pulley comprises: a wire winding part around which said drive wire is wound (fig.2, #32); and a groove provided to said wire winding part so as to hold said drive wire (fig.2, #30).

Regarding claim 68, Tsutsui et al. (US 4,728,988) teach an imaging apparatus comprising: an image reading apparatus (fig.4), the image reading apparatus comprising: an optical system for scanning and reading an image (fig.4, #17, #19); a running body including said optical system (fig.4, #3, #4); and a drive unit (fig.4, #1), the drive unit comprising: a drive shaft (fig.4, #29); a drive pulley attached to said drive shaft (fig.4, #25, #26); and a drive wire driven by said drive pulley (fig.4, #13, #14) so as to move the running body (fig.4, #3, #4).

Regarding claim 69, Tsutsui et al. (US 4,728,988) teach an image reading apparatus wherein said drive pulley comprises a hole through which said drive wire is passed (fig.1, #30).

Regarding claim 70, Tsutsui et al. (US 4,728,988) teach an image reading apparatus wherein said drive pulley comprises an engaging part that engages and holds said drive wire (fig.1, #27, #31; fig.3).

Regarding claim 73, Tsutsui et al. (US 4,728,988) teach an image reading apparatus wherein said drive pulley comprises engaging means for engaging and holding said drive wire (fig.1, #27, #31; fig.3).

Regarding claim 76, Tsutsui et al. (US 4,728,988) teach an image reading apparatus wherein said drive pulley appears to be formed so as to be press-fitted to said drive shaft (fig.2, shaft #29 protrudes from left hand side of pulley #25).

Regarding claim 78, Tsutsui et al. (US 4,728,988) teach an image reading apparatus wherein said drive pulley comprises at least one flange (fig.2, #25, though denoting the pulley, points one of two flanges).

Regarding claim 81, Tsutsui et al. (US 4,728,988) teach an image reading apparatus wherein said drive pulley comprises: a wire winding part around which said drive wire is wound (fig.2, #32); and a groove provided to said wire winding part so as to hold said drive wire (fig.2, #30).

However, Tsutsui et al. (US 4,728,988) fail to teach a pulley formed by press working or rolling or a pulley formed of a steel plate or thin-plate material.

Regarding claim 1, Watanabe et al. (US 5,441,456) teach a pulley wherein said pulley is formed by press working or rolling (col.1, ln.50-52).

Regarding claim 9, Watanabe et al. (US 5,441,456) teach a pulley wherein said pulley is formed so as to be press-fitted to a shaft (col.1, ln.45-47).

Regarding claim 14, Watanabe et al. (US 5,441,456) teach a pulley wherein said pulley comprises: a wire winding part around which a wire is wound (fig.3, #24); and a groove provided to said wire winding part so as to hold said wire (fig.3, #241).

Regarding claim 15, Watanabe et al. (US 5,441,456) teach a pulley wherein said pulley is formed of a steel plate (col.2, ln.32-33).

Regarding claim 16, Watanabe et al. (US 5,441,456) teach a pulley wherein said pulley is formed of a thin-plate material (col.2, ln.32-33).

Regarding claim 17, Watanabe et al. (US 5,441,456) teach a pulley formed by press working (col.1, ln.50-52) wherein said pulley is formed to be press-fitted to a shaft (col.1, ln.45-47).

Regarding claim 19, Watanabe et al. (US 5,441,456) teach a pulley formed by press working (col.1, ln.50-52) wherein said pulley is formed to be press-fitted to a shaft (col.1, ln.45-47).

Regarding claim 22, Watanabe et al. (US 5,441,456) teach a pulley formed by press working (col.1, ln.50-52).

Regarding claim 24, Watanabe et al. (US 5,441,456) teach a pulley wherein said pulley comprises: a wire winding part around which a wire is wound (fig.3, #24); and a groove provided to said wire winding part so as to hold said wire (fig.3, #241).

Regarding claim 25, Watanabe et al. (US 5,441,456) teach a pulley wherein said pulley is formed by press working or rolling (col.1, ln.50-52).

Regarding claim 26, Watanabe et al. (US 5,441,456) teach a pulley wherein a cylindrical part (fig.3, #24) and a fitting part (fig.3, #20) of the drive pulley are formed in a single process (fig.3, #20 is formed integrally with #24), the cylindrical part having the drive wire wound therearound and the fitting part fitted to the drive shaft.

Regarding claim 27, Watanabe et al. (US 5,441,456) teach a pulley wherein centering is performed on the cylindrical part and the fitting part of the drive pulley in the single process (col.2, ln.37-41; since both parts are formed integrally and to be concentric, centering is performed on both).

Regarding claim 28, Watanabe et al. (US 5,441,456) teach a pulley wherein the cylindrical part and the fitting part of the drive pulley is integrally formed of one piece of sheet metal (col2, ln.32-34).

Regarding claim 29, Watanabe et al. (US 5,441,456) teach a pulley wherein the drive pulley is formed of a steel plate (col2, ln.32-34).

Regarding claim 30, Watanabe et al. (US 5,441,456) teach a pulley wherein the drive pulley is formed of a thin-plate material (col2, ln.32-34).

Regarding claim 45, Watanabe et al. (US 5,441,456) teach a pulley wherein said pulley is formed by press working or rolling (col.1, ln.50-52).

Regarding claim 53, Watanabe et al. (US 5,441,456) teach a pulley wherein said pulley is formed so as to be press-fitted to a shaft (col.1, ln.45-47).

Regarding claim 58, Watanabe et al. (US 5,441,456) teach a pulley wherein said pulley comprises: a wire winding part around which a wire is wound (fig.3, #24); and a groove provided to said wire winding part so as to hold said wire (fig.3, #241).

Regarding claim 59, Watanabe et al. (US 5,441,456) teach a pulley wherein said pulley is formed of a steel plate (col.2, ln.32-33).

Regarding claim 60, Watanabe et al. (US 5,441,456) teach a pulley wherein said pulley is formed of a thin-plate material (col.2, ln.32-33).

Regarding claim 68, Watanabe et al. (US 5,441,456) teach a pulley wherein said pulley is formed by press working or rolling (col.1, ln.50-52).

Regarding claim 76, Watanabe et al. (US 5,441,456) teach a pulley wherein said pulley is formed so as to be press-fitted to a shaft (col.1, ln.45-47).

Regarding claim 81, Watanabe et al. (US 5,441,456) teach a pulley wherein said pulley comprises: a wire winding part around which a wire is wound (fig.3, #24); and a groove provided to said wire winding part so as to hold said wire (fig.3, #241).

Regarding claim 82, Watanabe et al. (US 5,441,456) teach a pulley wherein said pulley is formed of a steel plate (col.2, ln.32-33).

Regarding claim 83, Watanabe et al. (US 5,441,456) teach a pulley wherein said pulley is formed of a thin-plate material (col.2, ln.32-33).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the drive unit of Tsutsui et al. (US 4,728,988) with the press-formed pulley of Watanabe et al. (US 5,441,456) in order to decrease the cost and reduce the weight of the unit (col.1, ln.56-58).

Claims 4, 5, 7, 8, 12, 13, 23, 48, 49, 51, 52, 56, 57, 71, 72, 74, 75, 79, and 80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsutsui et al. (US 4,728,988) in view of Watanabe et al. (US 5,441,456) as applied to claims 1, 3, 6, 11, 22, 45, 47, 50, 55, 68, 70, 73, and 78 above, and further in view of Le Tourneau (US 2,374,111).

Tsutsui et al. (US 4,728,988) in view of Watanabe et al. (US 5,441,456) teaches all of the limitations of claims 1, 3, 6, 11, 22, 45, 47, 50, 55, 68, 70, 73, and 78 as applied above; however, Tsutsui et al. (US 4,728,988) in view of Watanabe et al. (US 5,441,456) fail to teach the engaging part or engaging means being either a cutout or having a drawn shape. Additionally, Tsutsui et al. (US 4,728,988) in view of Watanabe et al. (US 5,441,456) fail to teach the flange comprising a gap.

Regarding claims 4, 7, 48, 51, 71, and 74, Le Tourneau (US 2,374,111) teaches an engaging part for a wire mounted on a flange wherein said engaging part is a cutout (fig.1, #5; also, fig.4, #3/#4; also, cl.1, ln.3).

Regarding claims 5, 8, 49, 52, 72, and 75, Le Tourneau (US 2,374,111) teaches an engaging part for a wire mounted on a flange wherein said engaging part has a drawn shape (fig.3, #7 has a drawn shape).

Regarding claims 12, 23, 56, and 79, Le Tourneau (US 2,374,111) teaches a flange wherein said flange comprises a gap (fig.1, flange #2 has gap #3).

Regarding claims 13, 57, and 80, Le Tourneau (US 2,374,111) teaches a flange wherein a wire is held by at least one flange (figs.1-4, wire #6 held by engagement #4 in flange #2).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the pulley flange of Tsutsui et al. (US 4,728,988) in view of Watanabe et al. (US 5,441,456) with the engagement feature and gap of Le Tourneau (US 2,374,111) in order to provide a simplified, effective means of engaging the drive wire, which would make attachment easier, since there is no need for tool, screws, or extra parts, and which would decrease the overall cost since fewer pieces are needed and less work would be done since the cutout/drawing could be incorporated in the press working process of manufacture.

Claims 10, 18, 20, 21, 54, and 77 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsutsui et al. (US 4,728,988) in view of Watanabe et al. (US 5,441,456) as applied to claims 1, 17, 19, 20, 45, and 68 above, and further in view of Nelson (US 1,742,484).

Tsutsui et al. (US 4,728,988) in view of Watanabe et al. (US 5,441,456) teach all of the limitations of claims 1, 17, 19, 20, 45, and 68 as applied above and additionally teach the pulley of Tsutsui et al. attached to the shaft by a screw through a hub of the pulley into the shaft (fig.2, shaft#29 is attached to pulley#25 via a screw hole, unlabelled, through a hub of the pulley, also unlabelled); however, Tsutsui et al. (US 4,728,988) in view of Watanabe et al. (US 5,441,456) fail to teach the a pulley being

attached at a position adjustable with respect to said drive shaft in a rotational direction thereof and fail to teach the position adjustments being equal.

Regarding claims 10, 18, 20, 54, and 77, Nelson (US 1,742,484) teaches a two-part pulley (figs.1&2, part 1 - #16, part 2 - #12) wherein pulley part 1 is attached to pulley part 2 at a position that is adjustable with respect to said pulley part 2 in a rotational direction thereof.

Regarding claim 21, Nelson (US 1,742,484) teaches a two-part pulley (figs.1&2, part 1 - #16, part 2 - #12) wherein directions from which the positions are adjustable are equal (fig.2, position adjustment #20 solid and #20 dashed are equal, and furthermore, if two pulleys were used, the adjustment positions on each would be equal).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the drive pulley(s) attachment of Tsutsui et al. (US 4,728,988) in view of Watanabe et al. (US 5,441,456) with the adjustable two-piece attachment system illustrated in Nelson (US 1,742,484) in order to provide another mode of adjustment of the location of the pulley along the wire by being able to rotate it slightly along the periphery of the shaft, thus allowing one to improve image quality by keeping the carriage path parallel to the original document (as necessitated in Tsutsui et al. col.1, ln.47-63).

Claims 31-35, 38-42, and 61-65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsutsui et al. (US 4,728,988) in view of Nelson (US 1,742,484).

Regarding claim 31, Tsutsui et al. (US 4,728,988) teach a running body moving unit moving a running body by a mechanism transmitting a driving force to the running body through wires wound around a plurality of drive pulleys attached to a drive shaft without slack (fig.4, #1), wherein the drive shaft is provided with screw holes for fixing the drive pulleys to the drive shaft (fig.2, shaft#29 is attached to pulley#25 via a screw hole, unlabelled, through a hub of the pulley, also unlabelled); the drive pulleys are provided with attachment holes through which fixing screws are passed to be screwed into the screw holes (fig.2, shaft#29 is attached to pulley#25 via a screw hole, unlabelled, through a hub of the pulley, also unlabelled).

Regarding claim 38, Tsutsui et al. (US 4,728,988) teach an image reading apparatus comprising (fig.4): an optical system for scanning and reading an image (fig.4, #17, #19); a running body including said optical system (fig.4, #3, #4); and a running body moving unit moving said running body by a mechanism transmitting a driving force to said running body through wires wound around a plurality of drive pulleys attached to a drive shaft without slack (fig.4, #1), wherein the drive shaft is provided with screw holes for fixing the drive pulleys to the drive shaft (fig.2, shaft#29 is attached to pulley#25 via a screw hole, unlabelled, through a hub of the pulley, also unlabelled); the drive pulleys are provided with attachment holes through which fixing screws are passed to be screwed into the screw holes (fig.2, shaft#29 is attached to pulley#25 via a screw hole, unlabelled, through a hub of the pulley, also unlabelled).

Regarding claim 61, Tsutsui et al. (US 4,728,988) teach an imaging apparatus comprising: an image reading apparatus (fig.4), the image reading apparatus

comprising: an optical system for scanning and reading an image (fig.4, #17, #19); a running body including said optical system (fig.4, #3, #4); and a running body moving unit moving said running body by a mechanism transmitting a driving force to said running body through wires wound around a plurality of drive pulleys attached to a drive shaft without slack (fig.4, #1), wherein the drive shaft is provided with screw holes for fixing the drive pulleys to the drive shaft (fig.2, shaft#29 is attached to pulley#25 via a screw hole, unlabelled, through a hub of the pulley, also unlabelled); the drive pulleys are provided with attachment holes through which fixing screws are passed to be screwed into the screw holes (fig.2, shaft#29 is attached to pulley#25 via a screw hole, unlabelled, through a hub of the pulley, also unlabelled)

Regarding claim 61, Tsutsui et al. (US 4,728,988) teach an imaging apparatus comprising: an image reading apparatus (fig.4), the image reading apparatus comprising: an optical system for scanning and reading an image (fig.4, #17, #19); a running body including said optical system (fig.4, #3, #4); and a drive unit (fig.4, #1), the drive unit comprising: a drive shaft (fig.4, #29); a drive pulley attached to said drive shaft (fig.4, #25, #26); and a drive wire driven by said drive pulley (fig.4, #13, #14) so as to move the running body (fig.4, #3, #4).

However, Tsutsui et al. (US 4,728,988) fail to teach an attachment hole formed to have an elongation for adjustment.

Regarding claim 31, Nelson (US 1,742,484) teaches a two-part pulley (figs.1&2, part 1 - #16, part 2 - #12) wherein pulley part 1 is attached with a screw through hole #20 into hole #22 of pulley part 2 and wherein at least one of the attachment holes is

formed to have an elongation so that a position at which a corresponding one of the pulley parts is attached to the pulley shaft is adjustable with respect to the pulley shaft (fig.2, #20 is elongated and adjustable with respect to the shaft of #12).

Regarding claim 32, Nelson (US 1,742,484) teaches a pulley/pulley shaft attachment wherein the one of the attachment holes (fig.2, #20) has the elongation in a rotational direction of the pulley shaft (fig.2, #20 is aligned substantially in the direction in which shaft #12 rotates).

Regarding claim 33, Nelson (US 1,742,484) teaches a pulley/pulley shaft attachment wherein the position at which the corresponding one of the drive pulleys is attached to the drive shaft is adjustable in a rotational direction of the drive shaft (p.2, ln.94-96).

Regarding claim 34, Nelson (US 1,742,484) teaches a pulley/pulley shaft attachment wherein one of the attachment holes is a fixing hole (fig.1, hole #22 is a fixing hole on the pulley shaft #12).

Regarding claim 35, Nelson (US 1,742,484) teaches a pulley/pulley shaft attachment wherein the attachment holes are loose holes (fig.1, holes #20 are loose).

Regarding claim 38, Nelson (US 1,742,484) teaches a two-part pulley (figs.1&2, part 1 - #16, part 2 - #12) wherein pulley part 1 is attached with a screw through hole #20 into hole #22 of pulley part 2 and wherein at least one of the attachment holes is formed to have an elongation so that a position at which a corresponding one of the pulley parts is attached to the pulley shaft is adjustable with respect to the pulley shaft (fig.2, #20 is elongated and adjustable with respect to the shaft of #12).

Regarding claim 39, Nelson (US 1,742,484) teaches a pulley/pulley shaft attachment wherein the one of the attachment holes (fig.2, #20) has the elongation in a rotational direction of the pulley shaft (fig.2, #20 is aligned substantially in the direction in which shaft #12 rotates).

Regarding claim 40, Nelson (US 1,742,484) teaches a pulley/pulley shaft attachment wherein the position at which the corresponding one of the drive pulleys is attached to the drive shaft is adjustable in a rotational direction of the drive shaft (p.2, ln.94-96).

Regarding claim 41, Nelson (US 1,742,484) teaches a pulley/pulley shaft attachment wherein one of the attachment holes is a fixing hole (fig.1, hole #22 is a fixing hole on the pulley shaft #12).

Regarding claim 42, Nelson (US 1,742,484) teaches a pulley/pulley shaft attachment wherein the attachment holes are loose holes (fig.1, holes #20 are loose).

Regarding claim 61, Nelson (US 1,742,484) teaches a two-part pulley (figs.1&2, part 1 - #16, part 2 - #12) wherein pulley part 1 is attached with a screw through hole #20 into hole #22 of pulley part 2 and wherein at least one of the attachment holes is formed to have an elongation so that a position at which a corresponding one of the pulley parts is attached to the pulley shaft is adjustable with respect to the pulley shaft (fig.2, #20 is elongated and adjustable with respect to the shaft of #12).

Regarding claim 62, Nelson (US 1,742,484) teaches a pulley/pulley shaft attachment wherein the one of the attachment holes (fig.2, #20) has the elongation in a

rotational direction of the pulley shaft (fig.2, #20 is aligned substantially in the direction in which shaft #12 rotates).

Regarding claim 63, Nelson (US 1,742,484) teaches a pulley/pulley shaft attachment wherein the position at which the corresponding one of the drive pulleys is attached to the drive shaft is adjustable in a rotational direction of the drive shaft (p.2, ln.94-96).

Regarding claim 64, Nelson (US 1,742,484) teaches a pulley/pulley shaft attachment wherein one of the attachment holes is a fixing hole (fig.1, hole #22 is a fixing hole on the pulley shaft #12).

Regarding claim 65, Nelson (US 1,742,484) teaches a pulley/pulley shaft attachment wherein the attachment holes are loose holes (fig.1, holes #20 are loose).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the pulley/shaft attachment of Tsutsui et al. (US 4,728,988) with the attachment adjustment feature of elongated holes of Nelson (US 1,742,484) in order to provide another mode of adjustment of the location of the pulley along the wire by being able to rotate it slightly along the periphery of the shaft, thus allowing one to improve image quality by keeping the carriage path parallel to the original document (as necessitated in Tsutsui et al. col.1, ln.47-63).

Claims 36, 37, 43, 44, 66, and 67 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsutsui et al. (US 4,728,988) in view of Nelson (US 1,742,484) as

applied to claims 31, 38, and 61 above, and further in view of Watanabe et al. (US 5,441,456).

Tsutsui et al. (US 4,728,988) in view of Nelson (US 1,742,484) teach all of the limitations of claims 31, 38, and 61 as applied above; however, Tsutsui et al. (US 4,728,988) in view of Nelson (US 1,742,484) fail to teach the a pulley formed of sheet metal by plastic working or the fitting part and cylindrical part being formed integrally.

Regarding claims 36, 43, and 66, Watanabe et al. (US 5,441,456) teach a type pulley wherein the pulleys are formed of sheet metal by plastic working (col.2, ln.32-41)

Regarding claims 37, 44, and 67, Watanabe et al. (US 5,441,456) teach a type pulley wherein each of the drive pulleys comprises: a fitting part fitted to the drive shaft (fig.3, #20); and a cylindrical part around which a corresponding one of the wires is wound (fig.3, #24), wherein said fitting part and said cylindrical part are formed integrally with each other (fig.3, #20 is formed integrally with #24).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Tsutsui et al. (US 4,728,988) in view of Nelson (US 1,742,484) with the manufactured pulleys of Watanabe et al. (US 5,441,456) in order to decrease the cost and reduce the weight of the unit (col.1, ln.56-58).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Lewis et al. (US 5,147,248) teach a pulley with a screw hole for attachment to a shaft upon which the pulley is mounted.
- Roes et al. (US 5,951,422) teach a method of manufacturing a pulley from sheet metal and teaches the interchangeability of using the methods of press forming and rolling.
- Tanaka et al. (US 4,697,445) teach a method of manufacturing a pulley by plastic working.
- Young (US 2,339,311) teaches a spool for wrapping rope, wire, cable, or the like that features two flanges which have cutouts that serve as wire engagement features.
- Cavanagh (US 4,301,979) teaches a winch with a flange that has cutout grooves for holding the rope.

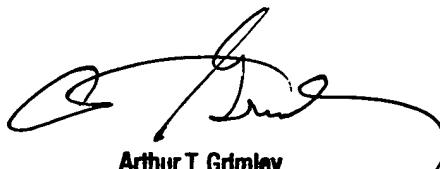
Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura K. Roth whose telephone number is (571)272-2154. The examiner can normally be reached on Monday-Friday, 7:30 am to 3:30 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Arthur T. Grimley can be reached on (571)272-2136. The fax phone

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LKR
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